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14/Appeal Brief
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PATENT-APPEAL

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of:

MICHAEL HANDFIELD, ET AL.

Serial No. 08/466,219

Filed: June 6, 1995

For: TIRE MONITORING VIA AN ELECTROMAGNETIC PATH INCLUDING THE GROUND PLANE OF A VEHICLE

Attorney Docket No. MCLA 0112 PUS

I hereby certify that this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on:

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By: David S. Bir — Registered Attorney
David S. Bir — Signature

APPEAL BRIEF

Assistant Commissioner for Patents
Washington, D. C. 20231

Dear Sir:

This is an appeal from the final rejection of Claims 1-23 of August 15, 1996.

A. Real Parties In Interest

The real parties for the present appeal include the inventors, Michael Handfield and Helene Laliberte, Animatronics, Inc., a Michigan corporation, and McLaughlin Electronics, a California corporation. The inventors have assigned the current application to Animatronics, Inc. The application is also subject to a Development Agreement entered into by Animatronics, Inc. and McLaughlin Electronics.

B. Related Appeals And Interferences

An appeal, the brief for which was mailed May 8, 1996 for application Serial No. 08/332,200 filed October 31, 1994 is directed to similar subject matter. However, Applicants do not believe that the appeal will have a bearing on the Board's decision in the instant case.

C. Status Of Claims

This divisional application was filed on June 6, 1995 with Claims 1-23. In response to the first Office Action, Applicants amended Claims 1, 7, 16, 17, 22, and 23 in a paper mailed June 28, 1996. Applicants have filed an Amendment After Final to make a number of minor corrections to Claims 2, 4-6, 8-10, 12, 14, 16, and 18-23.

Claims 1-23 were rejected under 35 U.S.C. § 103 as being unpatentable over Gerresheim et al. (4,909,074) in view of Merz (4,163,208). The rejection was maintained and made final in the second Office Action mailed August 15, 1996. The pending claims (as amended by the Amendment After Final which has not yet been considered) are reproduced for reference in attached Appendix A.

D. Status Of Amendments

An amendment has been filed subsequent to the final rejection by facsimile on January 30, 1997. The amendment addresses a number of informalities and does not affect the merits of the claims.

E. Summary Of The Invention

Applicants disclose and claim a system and method for monitoring a pneumatic tire which includes transmitting a signal indicative of the parameter along an electromagnetic path which

includes a plurality of conductive components of the vehicle as well as the ground plane of the vehicle. As disclosed in the specification on page 2 beginning at line 8, prior art devices which utilize a sensor mounted within a pneumatic tire are fraught with problems related to airwave communications. In particular, traditional radio frequency communications generated by a low-power transmitter, which relies on a battery as the source of power, are greatly attenuated by the metallic configuration of the vehicle frame and body. As such, the present invention utilizes the vehicle ground as part of the electromagnetic path to transmit signals between the tire parameter sensor and a central receiving unit as described on page 4, lines 7-11 of the specification.

The present invention is described in greater detail with reference to Fig. 4 beginning on page 18 of the specification. In the preferred embodiment, a communication link 12 is implemented via conductive components of the vehicle which constitute the electrical ground for the vehicle battery and other electrical systems. The vehicle ground 80 includes conductive elements such as a metallic wheel and the wheel bearings and axle, as well as the axle supports and vehicle frame as described on lines 13-16. The electromagnetic path, in effect, forms a common antenna between the transmitter (sensor) 22 and receiver 24. The transmitter 22 has its signal output 86 referenced to ground 82 which is isolated from the vehicle ground 80 as described on lines 7-9 of page 18. The signal output 86 is connected to vehicle ground 80 which is in turn connected to signal input 88 of receiver 24. Receiver 24 includes ground 84 which is isolated from the vehicle ground 80.

A particular implementation of the present invention is also described with reference to Figs. 5A and 5B beginning on page 22, line 16. As indicated, the vehicle ground 164 provides the primary communication link between the transmitter unit and the receiver.

Figs. 9A-9G illustrate one embodiment having various conductive components which form a part of the electromagnetic

path including the vehicle ground. As described beginning on page 31, line 15 and extending through page 32, line 22, the sensor/transmitter 10 is connected to a conductive wheel rim 314 via a stud rivet 312 which is spot welded to the interior wheel rim wall. Antenna connection 342 from the transmitter circuit is conductively attached to stud rivet 312 for conduction with the electromagnetic path as illustrated in Fig. 9C and described on page 32, lines 20-22.

As such, the present invention allows transmission of a relatively weak radio frequency signal by providing an electromagnetic path which acts as a common antenna between a sensor located within a pneumatic tire and a receiver centrally located within the vehicle. The electromagnetic path includes a plurality of conductive components in the ground plane of the vehicle.

F. Issues

Claims 1-23 have been rejected under 35 U.S.C. § 103 as being unpatentable over Gerresheim et al. (4,909,074) in view of Merz (4,334,428). Gerresheim et al. '074 disclose a method for determining and transmitting a variable air pressure value for a pneumatic vehicle tire. The information signal is transmitted in a non-contact manner from a measured value emitter to a measured value receiver. As disclosed in col. 4, lines 35-39, "the transmission of the information signals, the evaluation, and the indication can be effected with conventional known means and methods for non-contact transmission of measured values and/or can be effected in an electronic manner." (Emphasis added.) The non-contact transmission is described again beginning at col. 5, line 67 and extending through col. 6, line 6.

Gerresheim et al. '074 continued to explain that the signals generated by the pressure sensors are transmitted contactless onto a receiver via lines or conduits 14. The

signals are transmitted to processor 20 via further lines or conduits 19. (Col. 6, lines 39-43.)

Transmission of the information signal is described in greater detail in col. 9, lines 6-34. As described, Gerresheim et al. '074 transmit an information signal using a resonant or oscillatory circuit, i.e. an inductively coupled circuit. The primary circuit is used to excite the secondary circuit which transfers the signal in a contactless manner.

Merz '208 discloses a tire pressure sensor which uses a radio frequency transmitter to transmit signals to an operator station. The transmitter receives its power from an electromagnetic coil energized by rotation of the vehicle's wheel. As disclosed in col. 3, lines 18-22, the Merz invention transmits signals from the tires to the operator station by means of radio frequency signals. The radio frequency transmitter is powered by rotation of the wheels such that batteries or electrical power is eliminated. As described in col. 8, lines 48-50, the RF signals can be sent directly through the sidewalls or tread or any tire "wherein steel construction is not employed." (Emphasis added.)

The issue presented, therefore, is whether the Gerresheim '074 reference and Merz '208 reference make a *prima facie* showing of obviousness under 35 U.S.C. § 103 where there is no teaching or suggestion to monitor a tire parameter using an electromagnetic path extending between a transmitter and receiver wherein the electromagnetic path includes a plurality of conductive components of the vehicle and the ground plane of the vehicle.

G. Grouping Of Claims

Claims 1-23 directly or indirectly include generating a signal using a sensor disposed within the tire and transmitting the generated signal along an electromagnetic path wherein the path includes a plurality of conductive components and a ground

plane of the vehicle. As such, Claims 1-23 are believed to stand or fall together.

H. Argument

The prior art relied upon by the Examiner neither teaches nor suggests an electromagnetic path as claimed by Applicants.

Neither of the references applied by the Examiner address the problem solved by Applicants' invention: communicating a relatively weak signal from a sensor disposed within a pneumatic tire to a centrally located receiver. Gerresheim et al. repeatedly referred to a non-contact transfer or contactless transmission. The non-contact transmission is used to communicate between the sensor which is located within the tire and a receiver located in close proximity. The signals are then transmitted by "lines or conduits," presumably wires, to the central processor. There is no disclosure of an electromagnetic path which includes a plurality of conductive components in the ground plane of the vehicle as described and claimed by Applicants. In contrast, Applicants' conductive components necessarily require contact as compared to contactless transmission as taught by Gerresheim et al.

Similarly, Merz '208 also discloses a contactless transmission path. As illustrated in Figs. 1, 2, 4, 6, and 7-12, and described throughout, a radio frequency transmitter is used to transmit signals to an operator station. The transmitter receives its power from a coil energized by rotation of the wheel. While the RF signal may pass through various components of the vehicle, the electromagnetic path is essentially free space. The conductive components actually interfere with (alternate) the transmitted signal. There is no disclosure of transmitting the signal along an electromagnetic path which includes a plurality of conductive components and also the ground plane of the vehicle.

Applicants respectfully submit that utilization of the vehicle ground plane as a common antenna to provide an electromagnetic path is neither suggested nor disclosed by the references, nor an obvious matter of design choice as asserted by the Examiner. In fact, utilization of the ground plane for transmission of signals is believed to be counter-intuitive to one of ordinary skill in the art.

While Merz '208 arguably discloses an electromagnetic path, the path includes neither conductive components nor the ground plane of the vehicle as claimed by Applicants.

I. Summary

The prior art relied upon by the Examiner neither discloses nor suggests the use of an electromagnetic path formed of a plurality of conductive components and including the vehicle ground plane as claimed by Applicants. As such, it is respectfully submitted that the rejection under 35 U.S.C. § 103 is improper and should be reversed.

Respectfully submitted,
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DSB:ds
Enclosures:
- Appendix A (Claims 1-23)
- Petition For One-Month Extension (including Check #038051 for extension fee)
- Check #038055 (fling of Appeal Brief fee)

Dated: **January 30, 1997**